Forensic Science | 3.1 Soil Analysis Lab

You have been called in to perform a soil analysis on a murder case!
As you know, soil can be examined for a variety of chemical and physical properties. In this demonstration of your soil analysis skills, you will solve a "mini--mystery" by observing chemical and magnetic properties of sand.

Scenario:

A body has been found by a busy highway…investigators have determined that this is a secondary crime scene. Your task is to analyze sand found on the victim to determine which of two beaches may be the primary crime scene.

Procedure:

1. Click on Next button to begin the Chemical and Physical Analysis of Sand from the victim's shoes to help determine the most likely scene of the crime.
2. Simply follow the directions and answer the questions.

Data: (5 points)

Soil Sample (Sand)	Sulfate Test (White ppt)	Chloride Test (White ppt)	Carbonate Test (CO_2 Bubbles)	Magnetic Particle
Beach 1	yes	yes	yes	yes
Beach 2	no	yes	yes	no
Victim's shoes	yes	yes	yes	yes

Conclusion: (Complete sentences required - 1 point each)

1. Which beach is the primary crime scene? How do you know this?
   West cove beach, Because all the test results matched the results from the shoes
2. Which chemicals did you use to test for sulfates?
   Barium Chloride and Acetic acid
3. What do you see if sulfates are present?
   White solid forms
4. Which chemicals did you use to test for chlorides?

Silver nitrate and Acetic acid

5. What do you see if chlorides are present?
   White solid forms
6. Which chemicals did you use to test for carbonates?
   HCL acid
7. What do you see if carbonates are present?
   Bubbles of Co2 gas form
8. What does the magnet show?
   Whether or not there are magnetic particles in the sand

Analysis:

9. Explain at least 3 examples of how soil analysis can be useful in an investigation. (3 points)
   It can tell where a crime happened, it can tell where a victim or suspect has been before, if a suspect has soil from the crime scene on then, it can be used as evidence.
10. Conduct an internet search and find a case in which soil analysis was used to solve the case. Give a short summary of the case, including how soil evidence helped to solve the case. (at least 5-10 complete sentences - 4 points)
    In 1904, Eva Disch was found dead in Germany. The only evidence was a dirty handkerchief. Georg Popp discovered that the killer was Karl Laubach. Popp also examined Laubach's pants and discovered soil from the field where Eva was killed. This was the first time soil was used in forensics.